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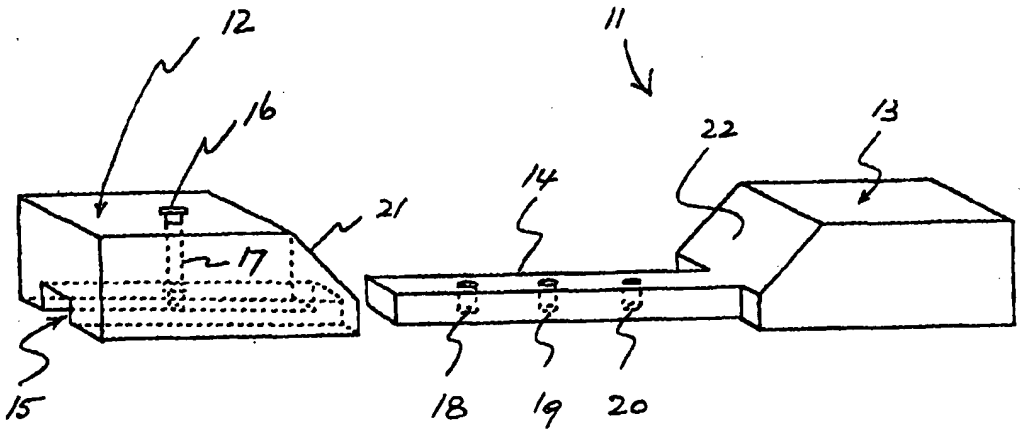

(57) Abstract

A support assembly which supports an object during transportation, the assembly including first and second chock means (11, 12) for bearing against the object; link means (14) for linking the chock means, and releasable fastening means in the form of pins (16) and apertures (17 and 18-20) for releasably fastening at least one of the chock means to the link means such that the distance between the chocks when linked by the link means is selectively variable and the support assembly is fabricated from material comprising a shredded/granulated synthetic rubber of particle size between substantially 1 mm and substantially 4 mm bonded by a polyurethane binder and having a friction coefficient of substantially 0.65 or more under wet or dry conditions; wherein the said chock meand includes a metal tube extended therethrough to dampen any vibration of said object upon braking.

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"SUPPORT"

Technical Field

This invention relates to supports and support assemblies.

The invention has particular but not exclusive application to supports and support assemblies for supporting loads during transportation thereof. The invention has more particular application to supports and support assemblies such as freight restraint cradles, saddles, chocks, wedges and the like for supporting heavy and/or bulky objects during transportation and for illustrative purposes reference will be made to such application. However it will be understood that the invention can be used in other applications not involving transportation.

Background of Invention

When heavy articles are transported, ie spools of copper wire such as transmission cables, and other heavy-material coils, rolls, strips, plates, rod bars etc, it is known to chock or brace the articles against movement during transportation by providing supports in the form of timber dunnage strips which can be cut to length. Metal and wooden chocks are also used.

The present invention aims to provide an alternative to known supports and support assemblies.

Summary of Invention

In one aspect this invention resides broadly in a support for supporting an object during transportation, the support including:-

an abutment face for frictionally engaging an object abutting thereagainst, and

a surface engaging face for frictionally engaging a surface on which the object is supported;

the support being fabricated from material comprising a shredded/granulated synthetic rubber of particle size

between substantially 1mm and substantially 4mm bonded by a polyurethane binder and having a friction coefficient of substantially 0.65 or more under wet or dry conditions.

The material may be cured by heating and in a preferred embodiment the material is heated during manufacture to a temperature of between substantially 90 and 100 degrees C for a period of between substantially 30 and 50 minutes.

The support may be of various shapes and in one embodiment the abutment face is angled to the surface engaging face, the support constituting at least one logitudinally extending wedge. The support may comprise a cradle having a pair of opposed wedges connected by a web.

In another embodiment the abutment face is substantially parallel to the surface engaging face, the support constituting longitudinally extending dunnage.

Preferably the support includes connecting means for releasably interconnecting a plurality of the supports longitudinally. The connecting means can be of different forms and could for example be a U-shaped spring clip connector each arm of which is adapted to be received within a corresponding recess in the end of each support. Alternatively the connecting means can include engagement means and recess means adapted to closely receive and be closely received respectively by the recess means and the engagement means on another support to thereby interconnect the supports longitudinally.

In another aspect this invention resides broadly in a support assembly for supporting an object during transportation, the assembly including:-

resilient first and second chock means for bearing against the object;

resilient link means for linking the chock means, and

releasable fastening means for releasably fastening at least one of the chock means to the link means, the distance between the chocks when linked by the link means being selectively variable;

wherein said chock means and said link means are made

from a material adapted to frictionally engage a surface on which said support assembly is supported and wherein the material in said chock means is substantially the same as the material in said link means and has substantially the same resilience and friction properties.

The support assembly may include surface engaging means for frictionally engaging a surface on which the support assembly is supported and in one example the surface engaging means may include a pad fixed to the chock means and/or the link means, the pad being made from a material adapted to frictionally engage a surface on which the support assembly is supported.

However it is preferred that the chock means and the link means are made from substantially the same material.

The material may be any suitable material for enhancing the frictional engagement between the support assembly and the surface on which the object is supported.

In a preferred embodiment the material is granulated synthetic rubber bonded by a polyurethane binder. A suitable material is made from recycled tyres and is available under the trade name REGUPOL.

It is preferred that the material is a shredded/granulated synthetic rubber of particle size between substantially 1mm and substantially 4mm bonded by a polyurethane binder and having a friction coefficient of substantially 0.65 or more under wet or dry conditions.

In a preferred embodiment the link means includes a plurality of link apertures. Suitably the chock means includes at least one chock aperture.

In one preferred embodiment the link means and at least one of the chock means are integral. Alternatively the link means may comprise a plurality of link members interengageable to constitute the link means.

A variety of fastening means may be utisised such as nuts and bolts, pins fixed to the chock means or a series of ribs on the chock means engageablein with complimentary recesses on the link means. In a preferred embodiment the fastening means includes spigot means engageable with a

selected one of the link apertures through one of the chock apertures.

Alternatively the releasable fastening means may comprise a plurality of teeth on the link means adapted to be closely received within corresponding recesses on the at least one chock means. Preferably the teeth are rectangular in profile and extend transversely across the link means.

It is preferred that the chock means includes an abutment face for abutment against the object. The abutment face may be inclined relative to the surface engaging means. Alternatively the abutment face may be substantially perpendicular relative to the surface engaging means.

It is preferred that at least one of the chock means includes a recess for closely receiving the link means.

The chock means may also include vibration damping means for damping the vibration of the object upon braking. The vibration damping means is preferably a tube.

In another aspect this invention resides broadly in a support assembly for supporting an object during transportation, said assembly including:-

first and second chock means for bearing against said object, and

link means for linking the chock means;

wherein the chock means includes vibration damping means for damping the vibration of the object upon braking.

The damping means may be a solid object such as a metal bar, flat or a length of timber. However it is preferred that the damping means is a metal tube extending through the chock means.

In a preferred embodiment the vibration damping means includes internal webs to strengthen the tube. The tube may have a variety of cross-sectional configurations and could for example be round, square, rectangular or triangular.

Description of Drawings

In order that this invention may be more easily understood and put into practical effect, reference will now be made to the accompanying drawings which illustrate a preferred embodiment of the invention, wherein:-

FIG 1 is a perspective view of a first embodiment of the invention.

FIGS 2 and 3 are perspective views of alternative embodiments of the invention;

FIG 4 is a cross-sectional elevation (not to scale) illustrating a number of articles arranged for transportation utilising the support assemblies of the invention;

FIG 5 is a perspective view of another embodiment of the invention;

FIGS 6A and 6B are perspective views of this further embodiment of the invention;

FIGS 7A and 7B are perspective views from above and below respectively of a support wedge in accordance with another aspect of the invention;

FIGS 8A and 8B are perspective views from above and below respectively of another support wedge in accordance with this other aspect of the invention;

FIG 9 is a perspective view of a number of the support wedges of FIG 7 illustrating the packaging of the wedges in a carrying kit;

FIGS 10A and 10B are perspective views from above and below respectively of a support cradle in accordance with this other aspect of the invention, and

FIGS 11A and 11B are perspective views from above and below respectively of a length of dunnage in accordance with this other aspect of the invention.

Description of Preferred Embodiment of Invention

As can be seen in FIG 1, a freight restraint 11 in accordance with the invention comprises a pair of opposed chock members 12 and 13. Chock member 13 has a link rail 14 integral therewith whereas chock member 12 has a recess

15 adapted to receive rail 14 therein.

Chock members 11 and 12 have ramped abutment faces 22 and 21 respectively for supporting a circular object during transportation.

A locating pin 16 is inserted in aperture 17 and adapted to be received in an appropriate one of apertures 18, 19, 20, logitudinally spaced along link rail 14.

The freight restraint is thus selectively variable in width to receive objects of differing diameter. Thus if pin 16 positions chock 12 by location in aperture 20, a 500-600mm coil can be supported in the freight restraint whereas if pin 16 positions chock 12 by location in aperture 18 a 1500-1800mm coil can be supported.

Alternatively as seen in FIG 2, the integral rail and chock member 11 seen in FIG 1 can be replaced by a pair of chock members 12 with the link rail being constituted by a number of interlocking link members 36. FIG 2 also illustrates alternating horizontal and vertical apertures 37,38 located in the link members and alternating horizontal and vertical apertures 33,32 located in the chock members.

As seen in FIG 3, the freight restraint in an alternative arrangement has only horizontal apertures 44 and 45 which combine with horizontal link apertures 46 in link member 43. FIG 3 also shows an alternative arrangement wherein the chock members 40,42 do not include a ramped abutment face, but rather have a vertical abutment face adapted to secure articles extending perpendicularly above the support surface.

The chock members and link members are made from a material made from recycled tyres and available under the trade name REGUPOL.

Pads of this material can be used rather than making the whole cradle from the material. The pads are affixed to the chocks and link members by a epoxy urethanes adhesive. A suitable two-part polyurethane adhesive is known by the trade name Regupol 81-9.

FIG 4 illustrates the invention in use. A pair of

coils 50, 51 and other transportable items such as hopper 54, box 52 and stack of bricks 53 are supported on a truck or rolling stock by a number of link segments 36 and chock members 12 and 40 respectively.

As can be seen in FIG 5, vibration dampers in the form of hollow rectangular tubes 61,62 can be moulded into the chock members. Furthermore, a reinforcing member in the form of a length of steel flat 63 can be moulded into the chock member with the link rail 14 to reinforce the neck between chock member and rail. Tubes 61,62 make the chock members more rigid and hence dampen the oscillation during vehicle braking of a load (eg concrete pipes or the like) cradled on the supports during transport. The apertures formed by the tubes also serve to receive a longitudinal strut or the like therethrough to positively locate a number of freight restraints on a vehicle. The apertures may also be used to pass holding straps or the like therethrough.

The vibration dampers may be solid metal or timber members. However the resilient surrounding of the rubber matrix means that the preferred tube member, which has weight advantages, is sufficiently strong to withstand the compressive forces generated by the load when oscillating upon braking without crushing the tube.

As can be seen in FIGS 6A and 6B, a freight restraint 71 in accordance with the invention comprises a pair of opposed chock members 72 and 73. Chock member 73 has a link rail 74 integral therewith whereas chock member 72 has a recess 75 adapted to receive rail 74 therein.

Chock members 72 and 73 have ramped abutment faces 83 and 84 respectively for supporting a circular object during transportation.

Link rail 74 has a number of rectangular teeth 76 formed therein separated by rectangular recesses 77, and link receiving recess 75 in chock 72 has a number of rectangular teeth receiving recesses 79 formed therein and separated by teeth 78. Teeth 76 and 78 can be closely received within corresponding recesses 77 and 79. Freight

restraint 71 is thus selectively variable in width to receive objects of differing diameter.

Vibration dampers in the form of hollow metal tubes 80,81 can be moulded into the chock members. Rectangular tube 81 and triangular tube 80 make the chock members more rigid and hence dampen the oscillation during vehicle braking of a load (eg concrete pipes or the like) cradled on the supports during transport.

Reinforcing members in the form of one or more webs located internally in the vibration damping tubes strengthen the tubes to prevent them being crushed under heavy load conditions. One such web 82 can be seen in tube 80.

In use when an object is to be supported on a truck etc for transportation, a pair of freight restraints are used. Depending on the size of the article, the two chock members in each freight restraint are positioned apart the required distance and the fastening pin located through the appropriate apertures in the chock member and the the link member.

When suitably located with each freight restraint separated transversely, the object is lifted into place on the freight restraint by a fork-lift, overhead crane etc. The object is then strapped downwardly onto the supporting surface of the transport vehicle, the strapping action sandwiching the freight restraint between the object and the vehicle support surface. The resilient nature of the compressed freight restraint results in the strapping remaining in tension. The frictional engagement of the vehicle support surface by the freight restraint is effective to minimise slippage during vehicle acceleration and braking.

As can be seen in FIGS 7A and 7B, a support in the form of a longitudinally extending wedge 110 has an upper object engaging abutment face 111 and a lower surface engaging face 112 for engaging a surface on which an object is placed. Wedge 110 has a short leading side 114 and a longer trailing side 113 such that object engaging abutment

face 111 is angled to the surface engaging face 112.

As can be seen in FIGS 8A and 8B, opposed ends of longitudinally extending wedge 115 have matching male and female connecting means 116 and 117 respectively which constitute connecting means whereby a plurality of wedges can be releasably interconnected in a longitudinal direction.

FIG 9 illustrates a carrying kit 118 in which a number of wedges 110 are complementarily stacked for carrying by frame 119.

Another embodiment of the invention is illustrated in FIGS 10A and 10B which show a support in the form of a cradle 120 having a pair of wedge members 121 and 122 having object engagement abutment faces 123 and 124 respectively. Wedges 121 and 122 are interconnected by a web 125. Cradle 120 has a lower surface engaging face 126 for frictionally engaging a surface on which an object is to be supported.

FIGS 11A and 11B illustrate another support in accordance with the invention. A length of dunnage 127 is substantially rectangular in shape with an upper object engaging abutment face 128 and a lower surface engaging face 129 for frictionally engaging a surface on which the object is to be supported. Dunnage 127 has a stepped cutout 130 at one end with a cup 131 and ball 132 arrangement constituting connecting means whereby a plurality of the lengths of dunnage may be releasably interconnected longitudinally. Alternatively the connecting means may comprise complementary, rectangular teeth and recesses.

The supports are made from a material composed of a shredded/granulated synthetic rubber bonded by a polyurethane binder which has a particularly high coefficient of friction of at least 0.65 under wet or dry conditions.

The particle size of the shredded/granulated synethetic rubber material, which in a preferred embodiment is made from recycled tyres, is limited to being between

substantially 1mm and substantially 4mm.

The shredded/granulated material is mixed with a suitable polyurethane binder such as that provided under the trade name REGUPOL BINDER, and the mixture cured at a temperature of between substantially 90 and 100 degrees C for a period of between substantially 30 and 50 minutes.

The supports are preferably manufactured by moulding.

Whereas it is known to produce a smooth and tough material using 1-2mm particles of shredded/granulated synthetic rubber mixed with a polyurethane binder by heating and suitably controlling the heating time, this process, which can for example produce vulcanised rubber, produces a material which is relatively slippery and has only minimal friction rating.

On the other hand using 4 - 5 millimeter particles with the same binder and manufacturing process will produce a relatively flexible material with high impact, resilience and bounce, and which is suitable for use in children's playground. The friction rating of this material, whilst greater than that described immediately above, is less than optimal for use as a support in transportation because it will collapse under heavy loading and fails on strength and friction criteria.

It has been surprisingly found that if the particle size is limited to between 1-4mm, under suitable curing conditions a material can be produced which has a friction rating of as high as 0.8. It is believed that the surprisingly high friction rating may be due to the existence of adequate air pockets within the shredded rubber when processed in accordance with the above method. The high friction rating of both surfaces of the supports in accordance with the present invention minimises movement during transport.

Materials having a friction rating of more than 0.65 under wet or dry conditions can advantageously be used to produce a support suitable for use in transporation because of the combination a number of desirable features including:-

* high-impact resistance;
* high resilience;
* high friction rating;
* unaffected by ultra-violet rays;
* unaffected by acids, and
* unaffected by heat and cold within a range of -40 to 90 degrees C.

In use, the supports in accordance with the present invention are used in the known manner. However, the supports of the present invention provide a friction rating on both the object engaging abutment face and the surface engaging face of the support sufficiently high such that objects supported thereby remain relatively stable due to both the resilience of the material and the frictional engagement of the support with both the object being transported and the surface (such as a truck tray or the like) on which it is being supported during transport.

Supports in accordance with the present invention thus have clear advantages over the known supports which are more likely to slide and which have inferior resilience to absorb loads and have friction restrictions which do not permit the safe restraint of loads with minimal support by chains.

Known chocking systems utilise up to six chains for heavier loads due to their inherantly low friction characteristics, whereas the system of the present invention has been successfully tested with a toll load of 12.5 tonnes using only two chains restrained on a lorry tilted to 40 degrees.

The freight restraint of the present invention facilitates easy lifting and sliding of one chock of the restraint to support both small and large coils and loads. The restraint does not require packing, the interchange of parts, complex re-tying, timber nailing or other complicated securing measures common with known systems.

The resilient rubber particle material is an improvement over existing freight restraints which require strong non-splintering or non-cracking materials capable of

withstanding fracture and great duress during transportation.

The freight restraint of the present invention fits differing sized coils and loads with one single unit. The number of coils being transported is determined by the number of pairs of freight restraints that can be carried on the truck.

The recycled rubber material used is extremely strong, is not affected by weather, and the high restraint to truck surface friction rating substantially prevents slipping.

The freight restraints are smaller than normal dunnage and do not need to be secured to a truck bed because they utilise load weight and friction only. They are user friendly and do not splinter as does wood. Moreover they are resilient, soft, and as they can be lifted with one hand they are easy and comfortable to handle.

Because of the compression resilience of the material, the more a load jars on rough roads the tighter the chocks squeeze onto the link piece and the apertures tighten on the pin. Furthermore the pin is prevented from bouncing out when loaded because the curve of a coil covers the pin without actually touching it.

The rubber material used in the preferred embodiment of this invention does not damage the outer skins of coils during transportation and prevents wastage caused by having to shed damaged outer skins.

The freight restraints of the present invention are economical in comparison with known arrangements as they do not have to be frequently replaced and can be manufactured at relatively low cost.

It will also be appreciated that the use of rubber from recycled tyres is environmentally friendly both in terms of preventing pollution by tyre dumping and by saving timber in avoiding usage of timber dunnage cut from "green" trees.

It will of course be realised that whilst the above has been given by way of an illustrative example of this invention, all such and other modifications and variations

hereto, as would be apparent to persons skilled in the art, are deemed to fall within the broad scope and ambit of this invention as is herein set forth.

Claims

1. A support for supporting an object during transportation, said support including:-

an abutment face for frictionally engaging an object abutting thereagainst, and

a surface engaging face for frictionally engaging a surface on which said object is supported;

said support being fabricated from material comprising a shredded/granulated synthetic rubber of particle size between substantially 1mm and substantially 4mm bonded by a polyurethane binder and having a friction coefficient of substantially 0.65 or more under wet or dry conditions.

2. A support as claimed in claim 1, wherein said material is heated during manufacture to a temperature of between substantially 90 and 100 degrees C for a period of between substantially 30 and 50 minutes.

3. A support as claimed in claim 1, wherein said abutment face is angled to said surface engaging face, said support constituting at least one longitudinally extending wedge.

4. A support as claimed in claim 3, and including connecting means for releasably interconnecting a plurality of said supports longitudinally.

5. A support as claimed in claim 4, wherein said connecting means includes engagement means and recess means adapted to closely receive and be closely received respectively by the recess means and the engagement means on another support to thereby interconnect the supports longitudinally.

6. A support as claimed in claim 3, wherein said support comprises a cradle having a pair of opposed wedges connected by a web.

7. A support as claimed in claim 1, wherein said abutment face is substantially parallel to said surface engaging face, said support constituting longitudinally extending dunnage.

8. A support as claimed in claim 7, and including connecting means for releasably interconnecting a plurality of said supports longitudinally.

9. A support as claimed in claim 8, wherein said connecting means includes engagement means and recess means adapted to closely receive and be closely received respectively by the recess means and the engagement means on another support to thereby interconnect the supports longitudinally.

10. A support assembly for supporting an object during transportation, said assembly including:-

resilient first and second chock means for bearing against said object;

resilient link means for linking said chock means, and

releasable fastening means for releasably fastening at least one of said chock means to said link means, the distance between said chocks when linked by said link means being selectively variable;

wherein said chock means and said link means are made from a material adapted to frictionally engage a surface on which said support assembly is supported and wherein the material in said chock means is substantially the same as the material in said link means and has substantially the same resilience and friction properties.

11. A support assembly as claimed in claim 10, wherein the material in said chock means is the same as the material in said link means.

12. A support assembly as claimed in claim 10, wherein said material is granulated synthetic rubber bonded by a

polyurethane binder.

13. A support assembly as claimed in claim 12, wherein said material is a shredded/granulated synthetic rubber of particle size between substantially 1mm and substantially 4mm bonded by a polyurethane binder and having a friction coefficient of substantially 0.65 or more under wet or dry conditions.

14. A support assembly as claimed in claim 10, wherein said link means includes a plurality of link apertures.

15. A support assembly as claimed in claim 14, wherein said chock means includes at least one chock aperture.

16. A support assembly as claimed in claim 10, wherein said link means and at least one of said chock means are integral.

17. A support assembly as claimed in claim 10, wherein said link means comprises a plurality of interengageable link members.

18. A support assembly as claimed in claim 15, wherein said fastening means includes spigot means engageable with a selected one of said link apertures through one of said chock apertures.

19. A support assembly as claimed in claim 10, wherein said releasable fastening means comprise a plurality of teeth on said link means adapted to be closely received within corresponding recesses on said at least one chock means.

20. A support assembly as claimed in claim 19, wherein said teeth are rectangular in profile and extend transversely across said link means.

21. A support assembly as claimed in claim 10, wherein said chock means includes an abutment face for abutment against said object.

22. A support assembly as claimed in claim 21, wherein said abutment face is inclined relative to said surface engaging means.

23. A support assembly as claimed in claim 21, wherein said abutment face is substantially perpendicular relative to said surface engaging means.

24. A support assembly as claimed in claim 10, wherein said at least one of the chock means includes a recess for closely receiving said link means.

25. A support assembly as claimed in claim 10, wherein said chock means includes vibration damping means for damping the vibration of said object upon braking.

26. A support assembly as claimed in claim 25, wherein said vibration damping means is a tube.

27. A support assembly for supporting an object during transportation, said assembly including:-

first and second chock means for bearing against said object, and

link means for linking said chock means;

wherein said chock means includes vibration damping means for damping the vibration of said object upon braking.

28. A support assembly as claimed in claim 27, wherein said vibration damping means comprising a metal tube extending through said chock means.

29. A support assembly as claimed in claim 28, wherein said tube includes internal webs to strengthen said tube.

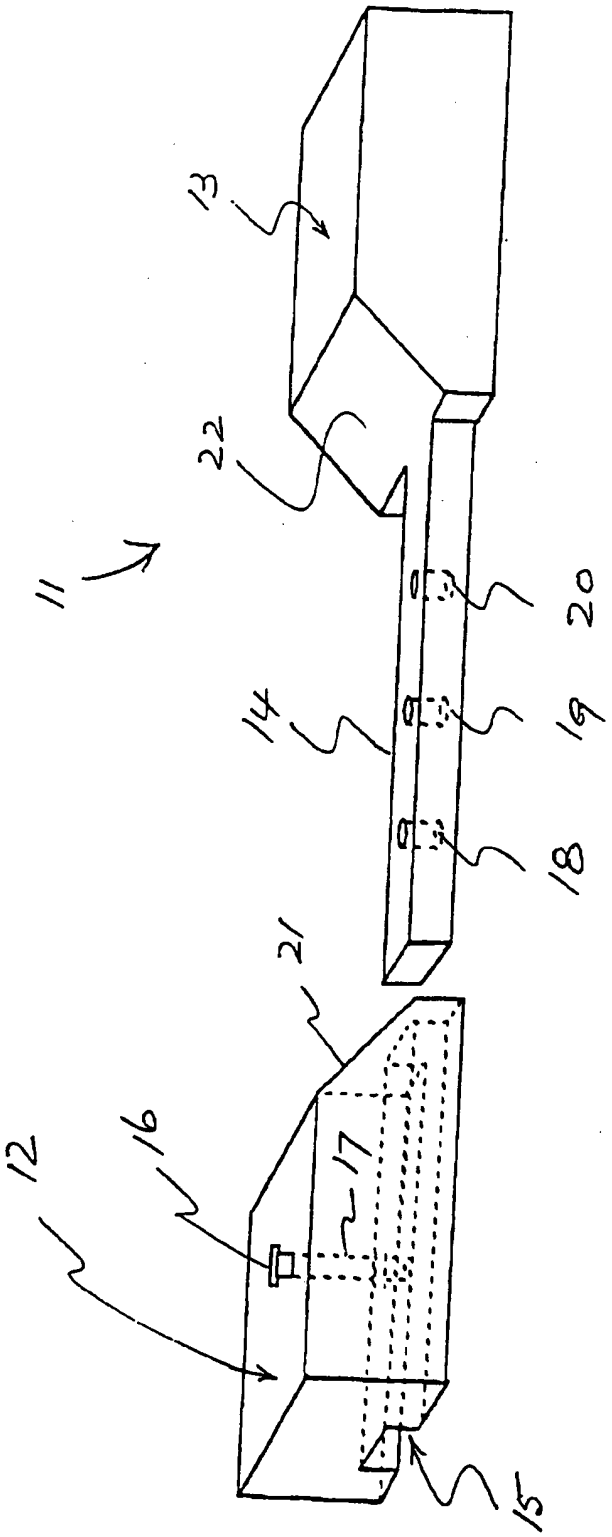

FIG 1

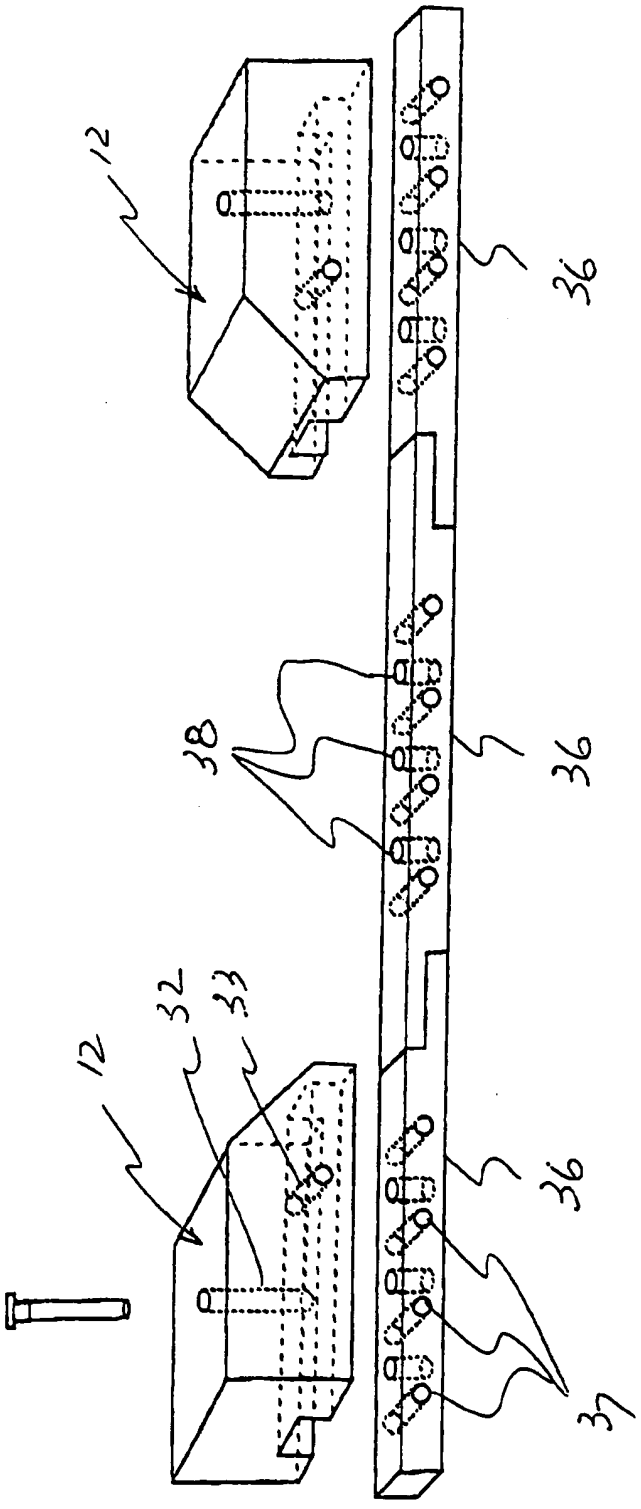

FIG 2

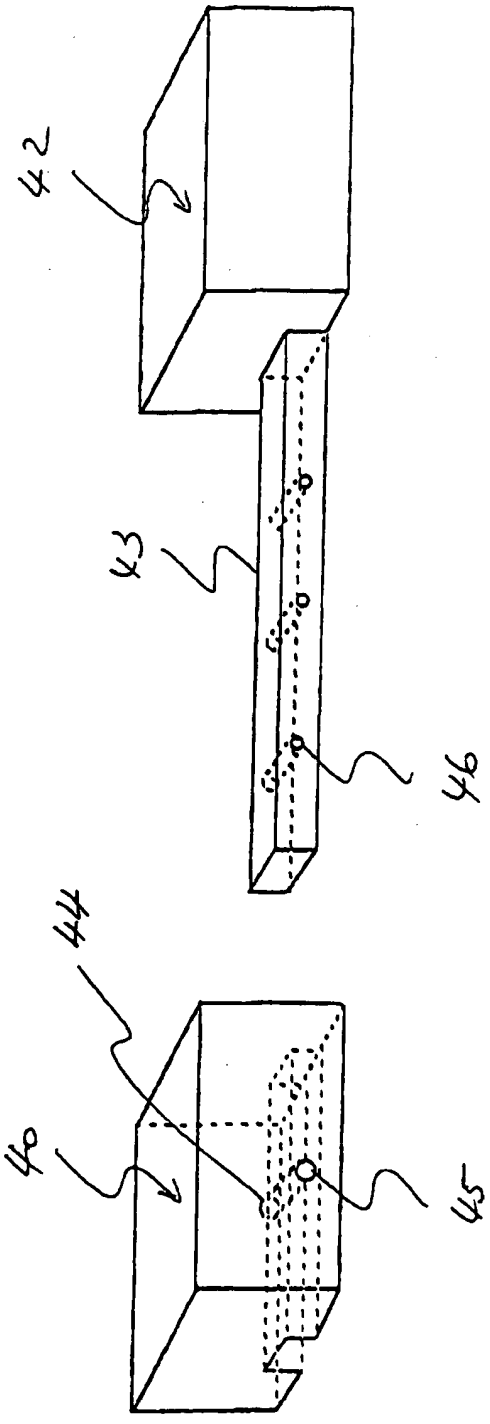

FIG 3

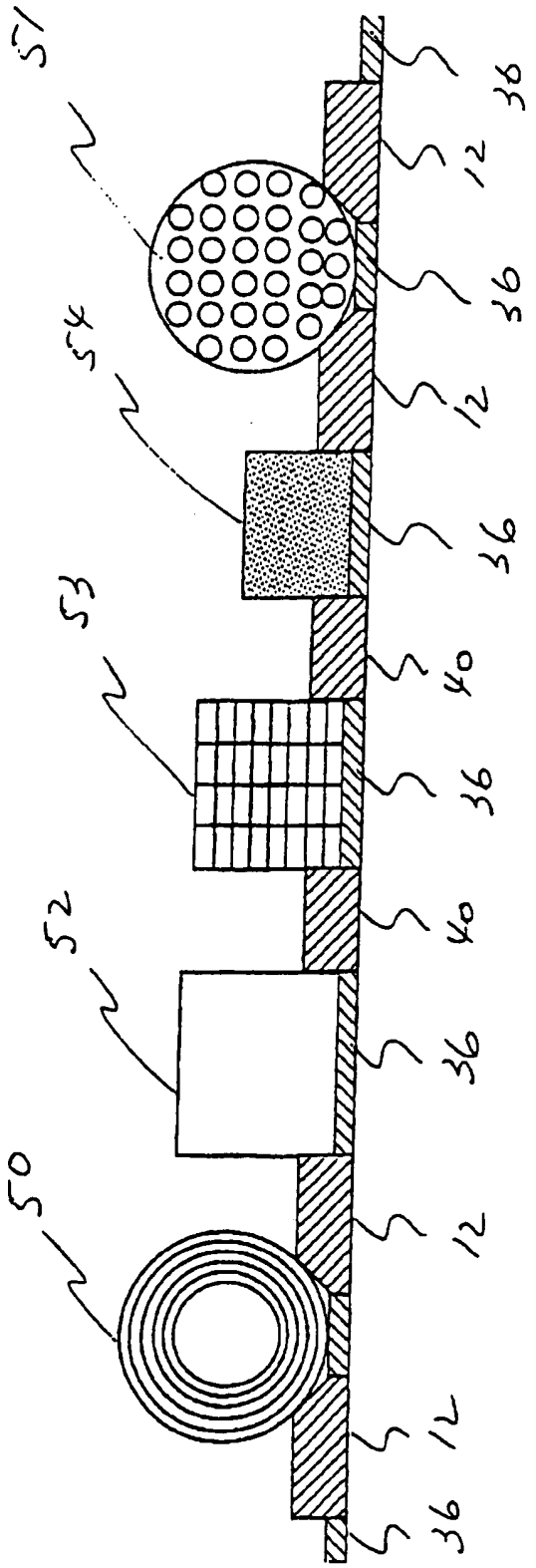

FIG 4

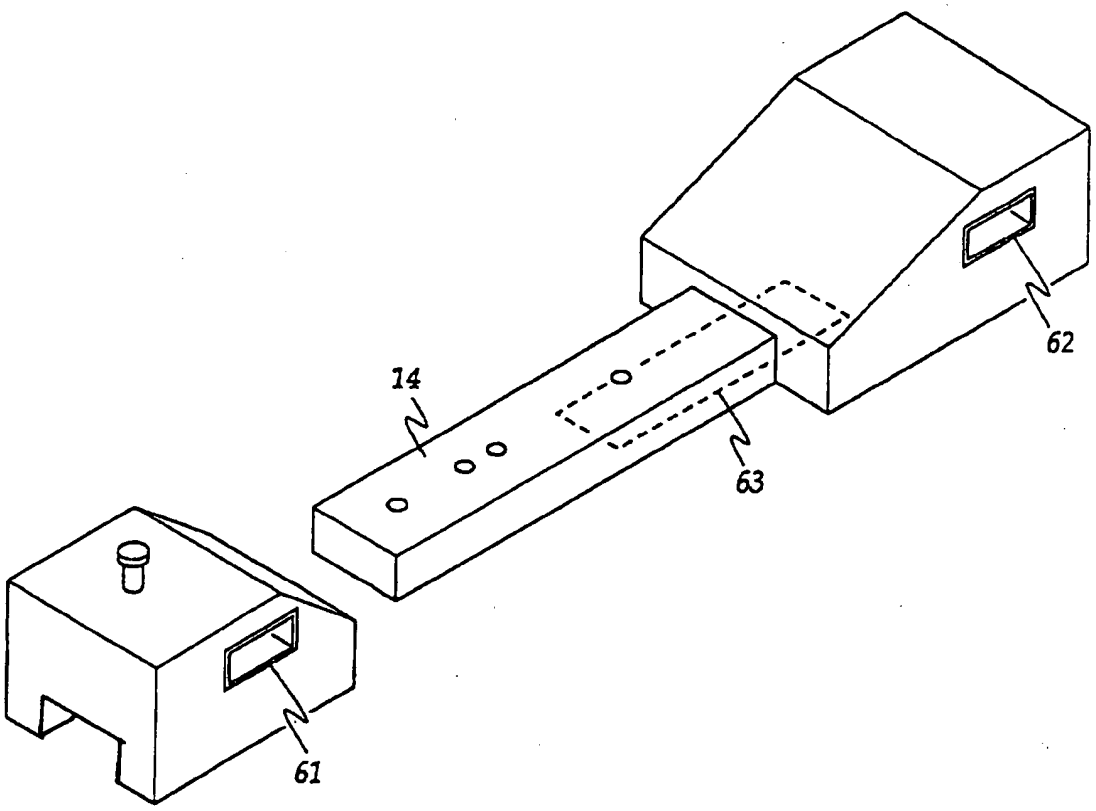

FIG 5

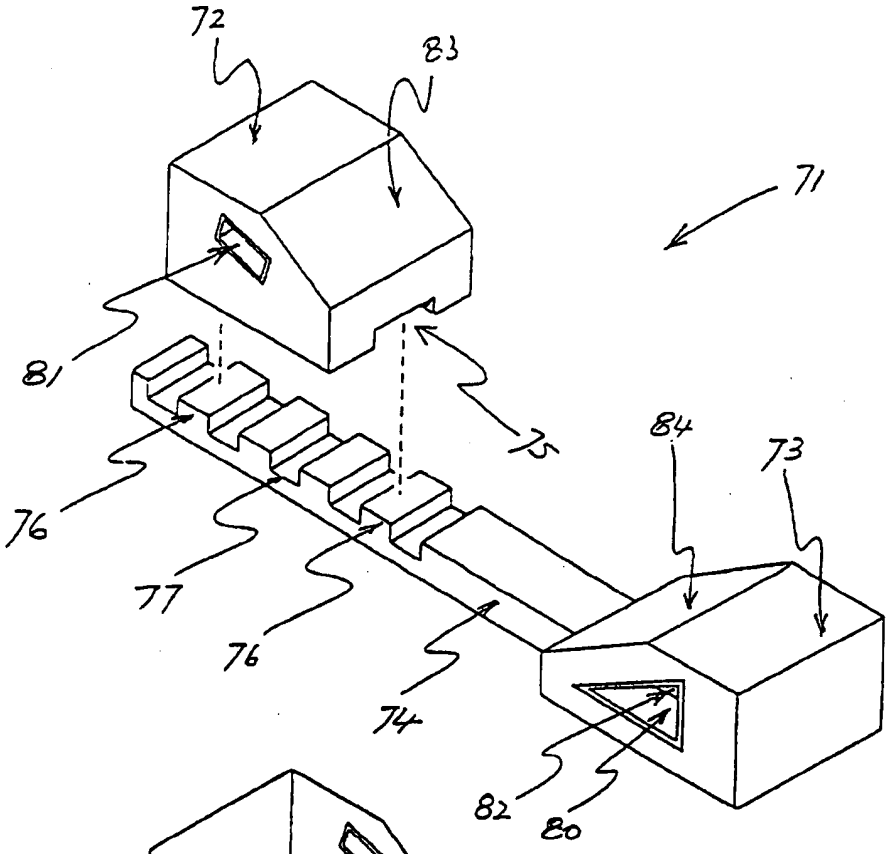

FIG 6A

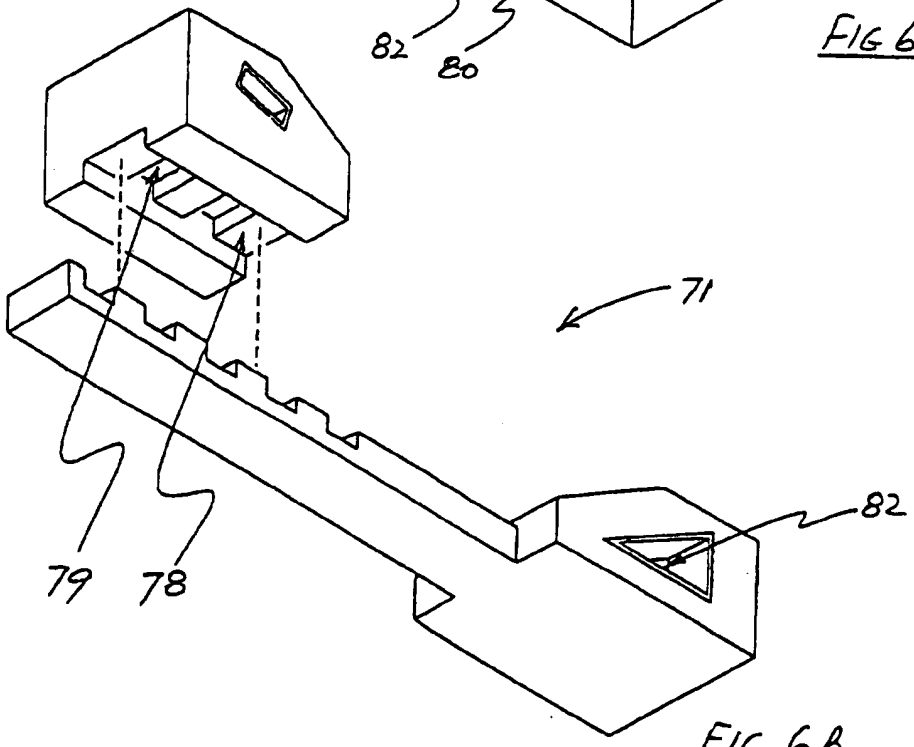

FIG 6B

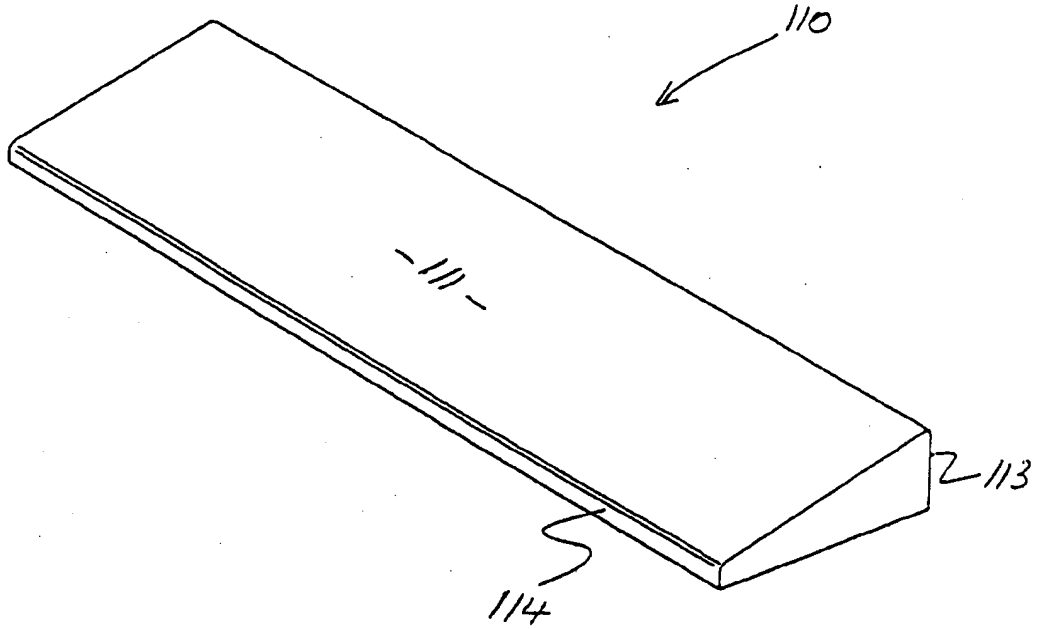

FIG 7A

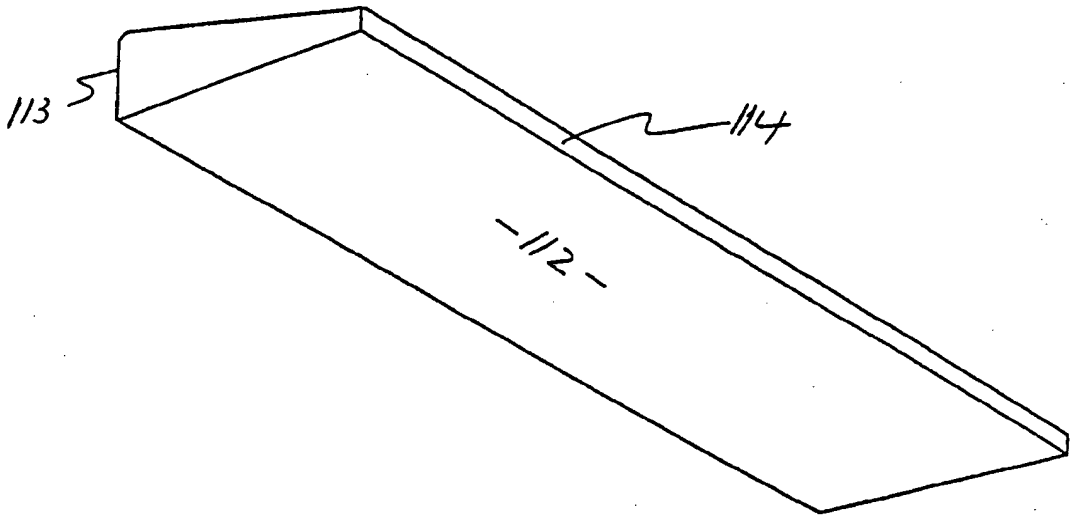

FIG 7B

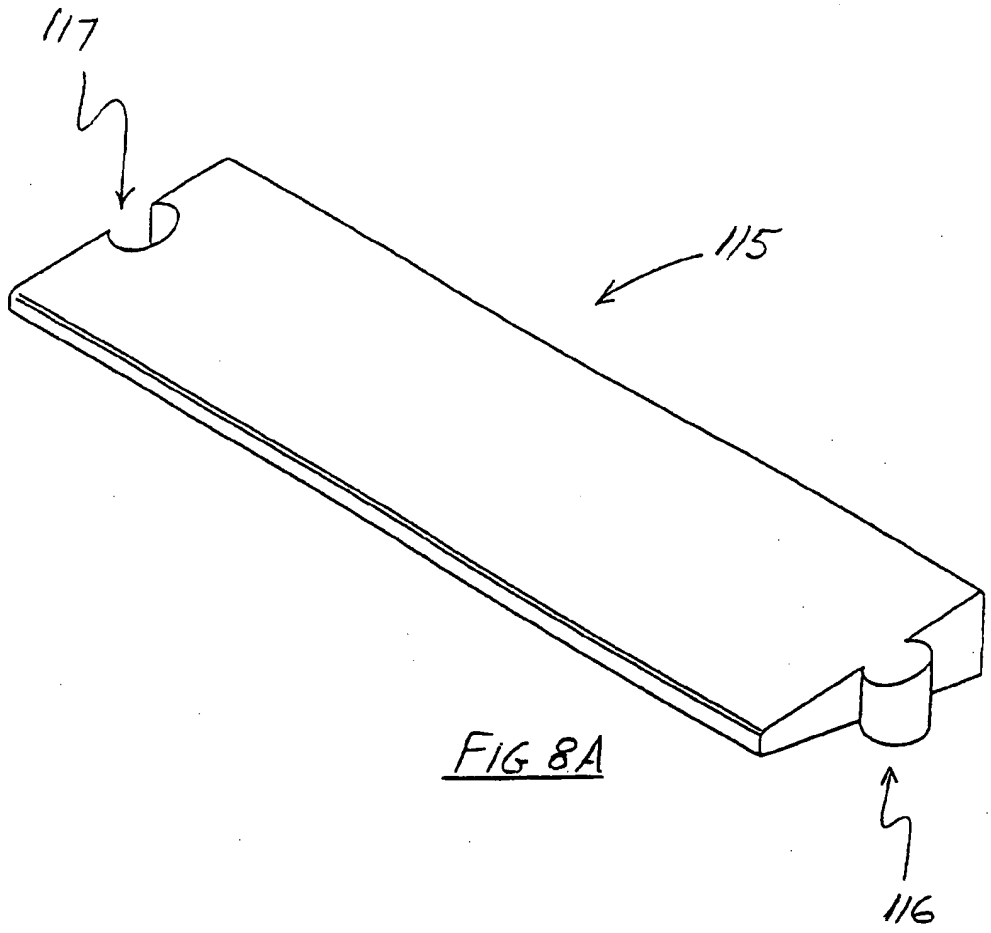

FIG 8A

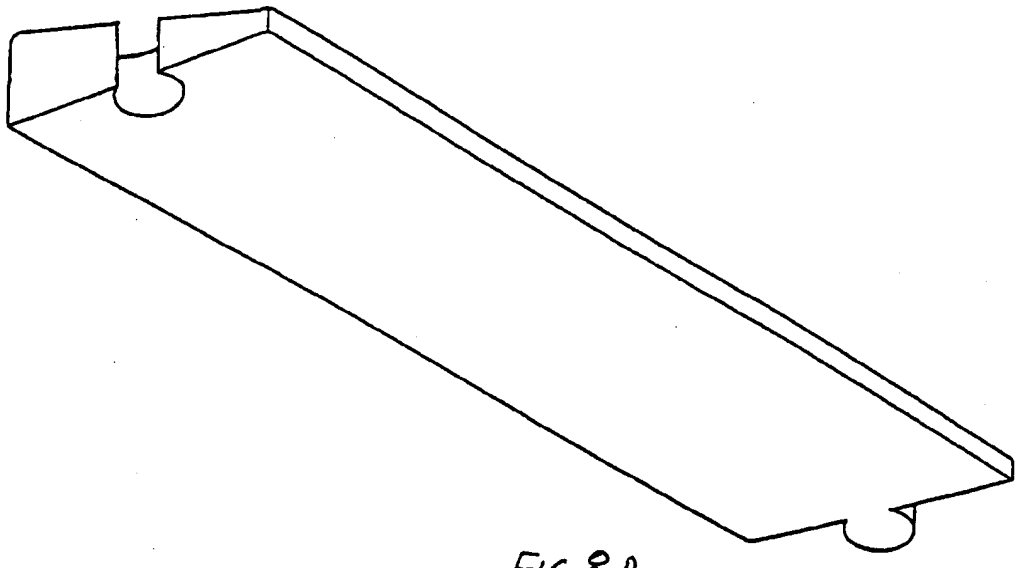

FIG 8B

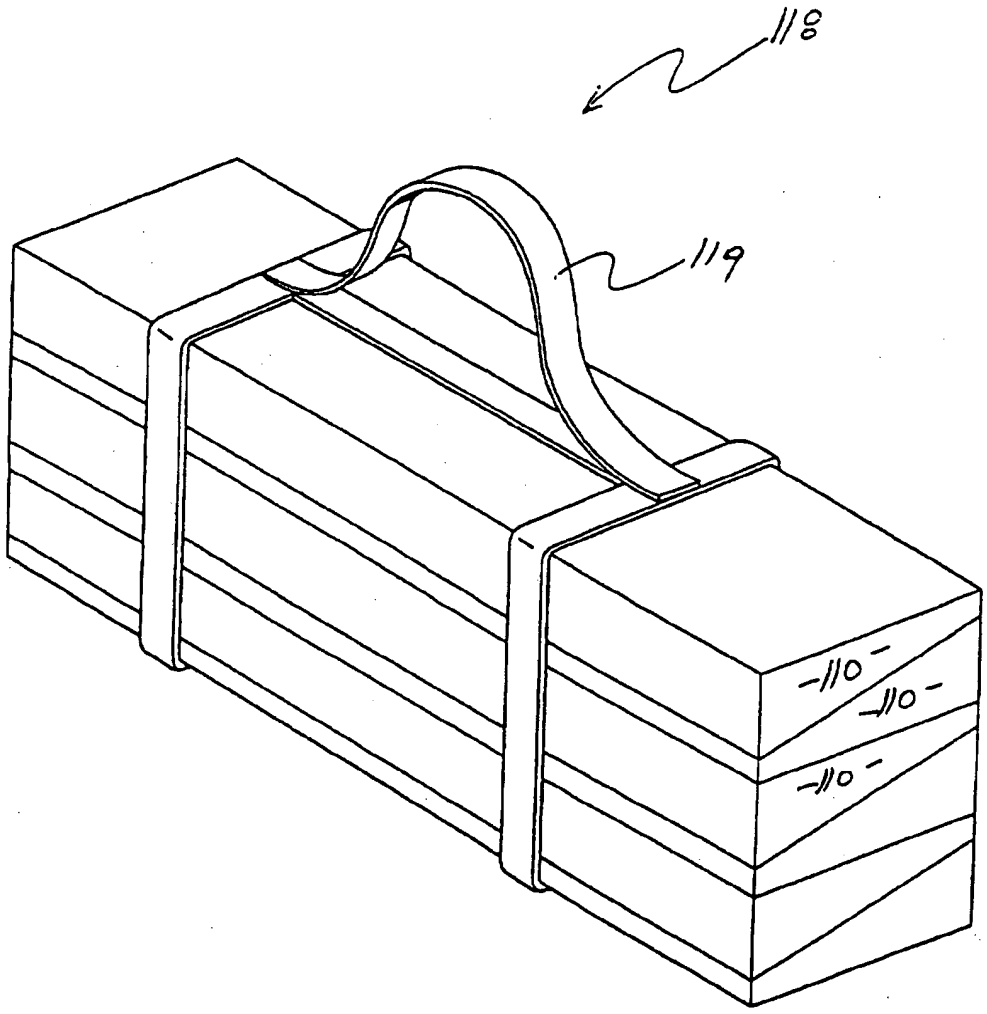

FIG 9

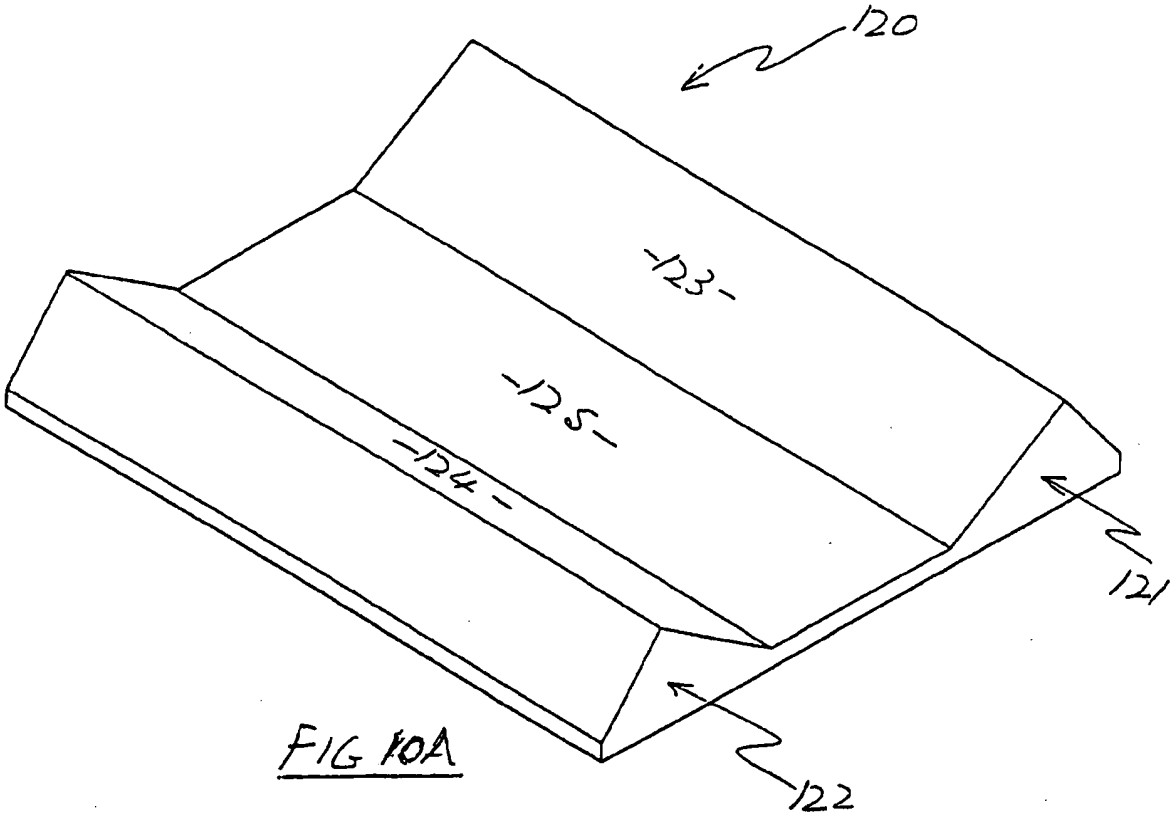

FIG 10A

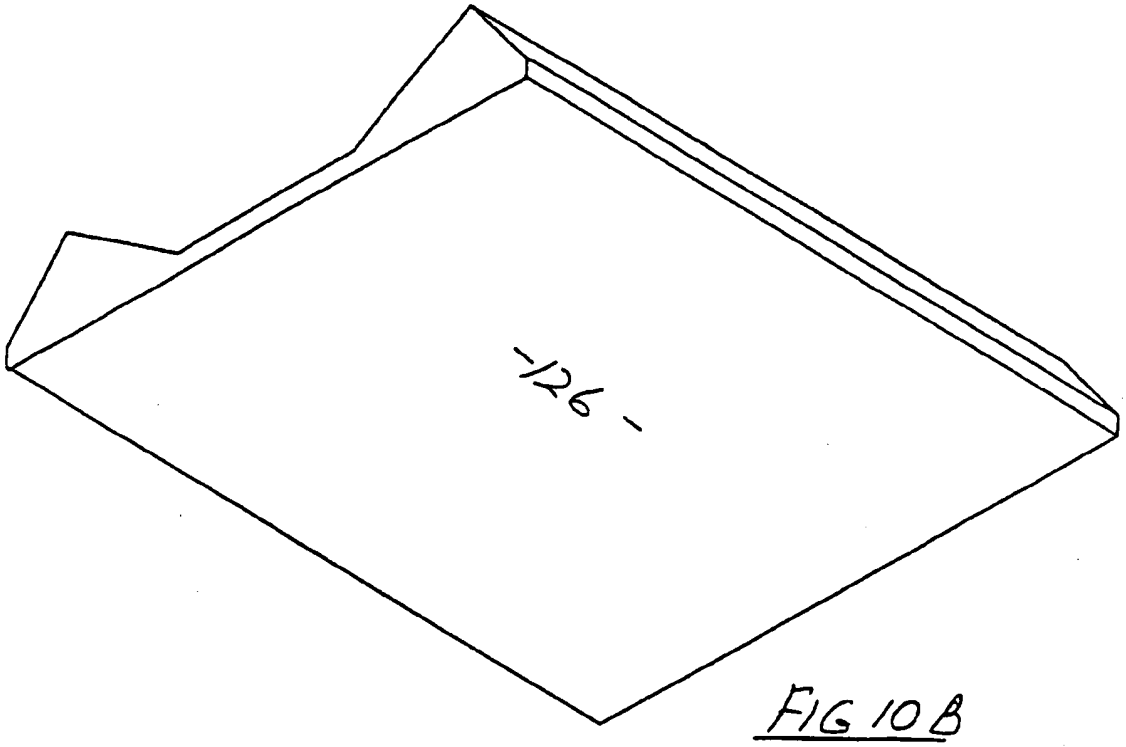

FIG 10B

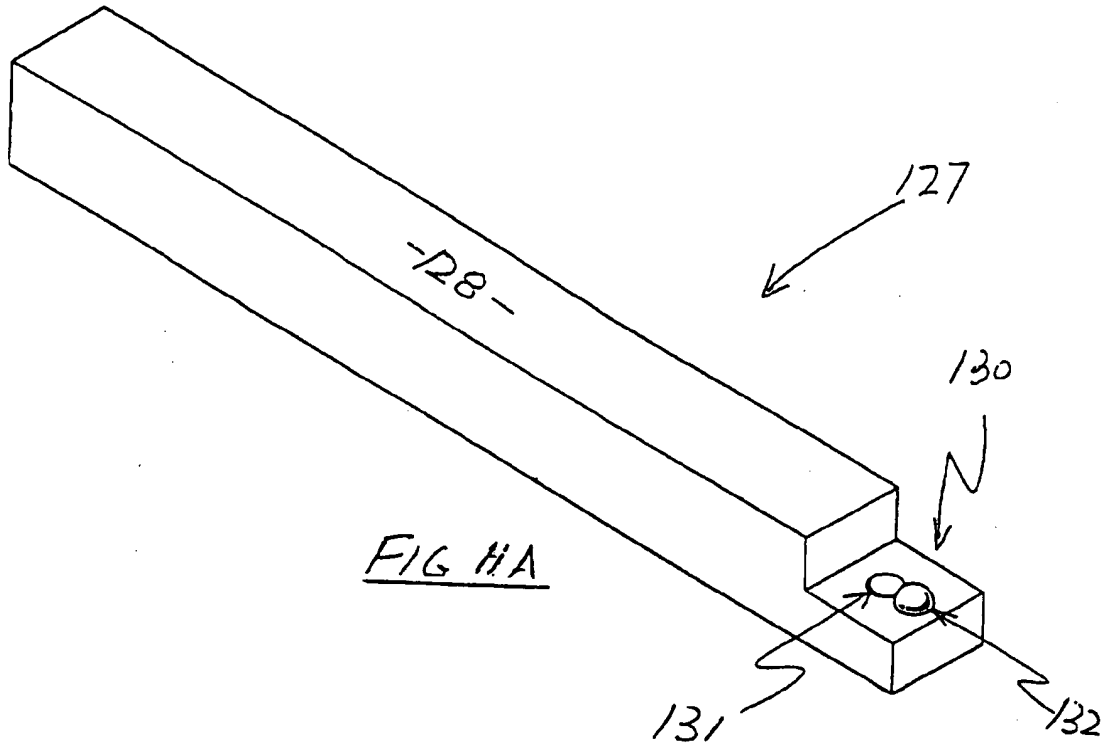

FIG 11A

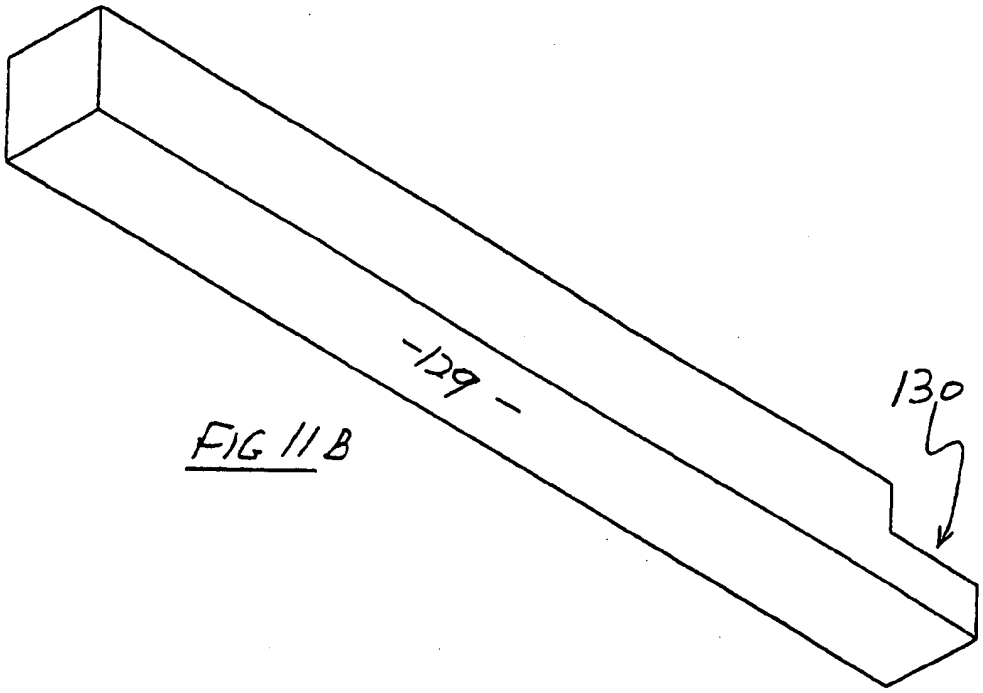

FIG 11B

INTERNATIONAL SEARCH REPORT

International Application No.
PCT/AU 97/00330

A. CLASSIFICATION OF SUBJECT MATTER

Int Cl[6]: B60T 3/00, B60P 7/12, 7/10, 3/07, 3/077

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC: B60T 3/00, B60P, 7/-, 3/07, 3/077, B65D 67/00, B63B 25/24

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
AU: IPC as above.

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
DERWENT; CHOCK:/WEDG:

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DT 2363544 A1 (HAYNES) 26 June 1975 page 4, line 28 - page 8, line 32, Figures 1-4	10-12, 16, 21-24
Y	-do-	25
X	GB 1465136 B (HYDRAULIKPRODUKTER AB) 23 February 1977 page 1, line 90 - page 2 line 84, Figures 1, 2	27
Y	-do-	25

[X] Further documents are listed in the continuation of Box C

[X] See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
8 August 1997	05 SEP 1997
Name and mailing address of the ISA/AU AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION PO BOX 200 WODEN ACT 2606 AUSTRALIA Facsimile No.: (02) 6285 3929	Authorized officer **R. SUBBARAYAN** Telephone No.: (02) 6283 2377

INTERNATIONAL SEARCH REPORT

International Application No.
PCT/AU 97/00330

C (Continuation) **DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2236687 A1 (KISHIMOTO) 7 February 1975 page 2, line 11, page 4, line 12, Figures 1-3	27
A	US 3993167 A (REED) 23 November 1976 Abstract and Figure	1
A	WO 92/06012 A1 (KOMBIPAK A/S et al) 16 April 1992 Abstract and Figure	1
A	US 3317007 A (BRAUN) 2 May 1967 See the whole document	10
A	US 3999059 A (RICKS et al) 21 December 1976 See the whole document	27
A	US 2822063 A (HAMPTON) 4 February 1958 See the whole document	27
A	DE 883127A (BEHRENS) 16 July 1953 See the whole document.	27

INTERNATIONAL SEARCH REPORT
Information on patent family members

International Application No.
PCT/AU 97/00330

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
GB	1465136	CA	1017710	DE	2510635	DK	996/75
		FI	750720	FR	2263960	JP	50121958
US	3993167	CA	1001569				

END OF ANNEX